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INVISIBLE IRRIGATION:
WATER MANAGEMENT IN
NORTHEAST THAILAND

Irrigation systems developed by villagers are far less conspicuous than the dams and concrete canals of large government constructed projects. Indigenous irrigation systems grow from villagers' attempts to control water, rather than being constructed according to an outside blueprint. The resulting systems of earth weirs, pipes and field-to-field flows may be almost invisible to anyone not specifically looking for them. The common view has been that there is no indigenous irrigation in northeast Thailand. The truth seems to be that on almost any stream one can find irrigation systems developed by farmers.

As in most rice growing areas, the northeastern landscape is the result of many years of work by farmers creating paddy fields, with the primary purpose of controlling water in order to grow rice. Farmers in the flat or rolling terrain of the northeast are already extensively involved in

controlling water even if their paddies are "rainfed".

The elements of water management include levelled fields, paddy dikes and larger embankments, pipes, roadside ditches used to carry water, and paths which sometimes serve as stream channels. Villagers build weirs of earth and wood to divert water for growing rice and store water for livestock, fishing, gardening and domestic use in the long dry season.

The hardware and software of water management in northeast Thailand are often hard to observe. Most systems are small, for example a dozen households with thirty hectares receiving supplementary irrigation. Farmers organize informally, mobilizing resources on an ad hoc basis to build and rebuild earth weirs. Most conflicts are avoided, repressed, or carried on covertly. The usual pattern of water allocation requires little coordination; those with best access, who can get the water first, take all they need and then pass on any excess by field to field flow. There is usually no prescribed or formal plan for water distribution. The final pattern of water management is the result of many interdependent decisions and actions, the product of managed conflict.

Indigenous water management is opportunistic, adapted to uncertain rainfall. Management does not follow a fixed schedule but varies from year to year, responding to early and late rains, dry spells, floods and the success or failure of past efforts. While average annual rainfall in the northeast ranges from 1000 to 1500 millimeters per year, actual rainfall varies greatly from year to year. Dry spells are common during the rainy season from May to October. Farmers must be ready to make use of water when it is available. Rather than being able to rely on steady base flows, irrigation must depend largely

on peak stream flows which follow storms.

Much water management activity takes place while it is raining, when outside observers are unlikely to be present. Farmers control flows of water with inconspicuous wood, bamboo or cement pipes, releasing water into fields and sending it on from field to field.

Paddy field dikes are a principal component of the traditional system of controlling water. They hold water in, or keep it out. Dikes are a major site of maintenance activity. Farmers reinforce dikes with wooden and bamboo stakes. Bare patches of earth show where farmers have recently added earth, to raise a dike or fill an eroded or washed out section. Bamboo and other plants help hold structures together. Maintenance of indigenous irrigation systems is largely the process of maintaining earth structures.

Larger dikes and levees store water behind weirs and keep it from flooding fields. Earth weirs and levees blend into the landscape, resembling natural structures, with little to emphasize the large investments of labor and capital involved in construction. When villagers continue construction over many years, and perhaps hire tractors or bulldozers, the total investment easily adds up to hundreds of thousands of baht (U.S. \$1=26 baht). Construction may be done by individual households, groups of people with adjoining fields or by a village. The presence of levees, dikes and weirs in farmer managed irrigation should not be taken for granted. Rather, they reveal activity and investment to improve water control.

Canals may or may not form part of farmer managed irrigation systems. They allow wider and more rapid distribution of water than is possible

with field to field flow, but use valuable land, and complex negotiations may be required before they can be built. The presence of canals may indicate the amount of water diverted, the level of organization which existed in developing the system and how widely benefits are distributed.

Stream channels store significant amounts of water backed up behind an earth or concrete weir. The still surface of the water says little about the amount stored or the investments made store it. Such stored water is a major resource for dry season use for pumping during the wet season. Small pumps owned by farmers are playing an increasingly important role in the northeast. These pumps are frequently used to lift water stored behind weirs and move water between fields. Concrete weirs often are built where farmers previously built earth weirs. Government funding and technical assistance have increased the resources available for managing water, but are placed within existing irrigation systems, rather than replacing previous patterns.

The seemingly natural landscape of paddy fields, dikes, larger embankments, paths and ditches is the result of large amounts of labor invested to improve water control. The invisibility of such systems hides the sophistication of water management which actually exists. Concrete weirs and motorized pumps are woven into this existing pattern as they increase the ability of farmers to move water to supply the needs of crops. In order to understand the potential for change it is crucial to understand how farmers have managed water in the past. []

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AN ISSUE IN FMIS: Farmers' Management Skills

Engineering Skills. Development of irrigation infrastructure both at the individual and community level has been accorded priority under recent government programs [in Nepal and elsewhere]. Financial assistance made available to farmers has helped initiate a large number of irrigation schemes. A pre-requisite for such projects is farmers' acceptance of management responsibility. An important concern is the delivery of skills for ensuring proper management of these schemes. There is a danger that the number of underutilized or abandoned schemes could increase in a rising proportion unless adequate attention is given to this issue.

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Farmer-to-Farmer Training. Programs to train farmers are usually organized by government training institutes; there has not been much effort to transfer management skills from farmers to other farmers. In Nepal, an experiment took farmers from poorly-managed FMIS and newly completed agency-managed systems to visit well-organized systems and discuss management issues with the farmers there. Such systems present an immediate contrast, and farmers start asking questions about their own context: "If they can do it, why can't we do the same thing?" We in Nepal would like to hear of attempts to transfer management skills from farmer to farmer that have been tried elsewhere. If you have any information or experience about this please let us know.

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